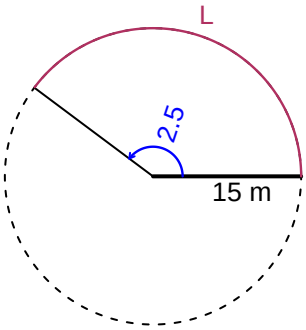
Name: Date:

Trig Final (Practice v49)

- You can use a calculator (like Desmos)
- You should have a unit-circle with special angles and coordinates marked.

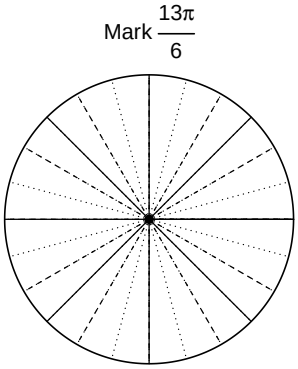
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 2.5 radians. The radius is 15 meters. How long is the arc in meters?

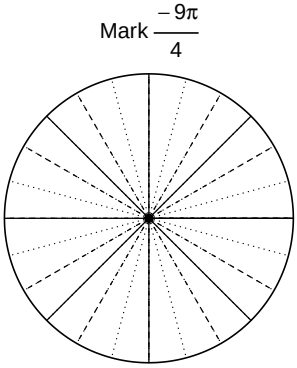


Question 2

Consider angles $\frac{13\pi}{6}$ and $\frac{-9\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(\frac{13\pi}{6}\right)$ and $\cos\left(\frac{-9\pi}{4}\right)$ by using a unit circle (provided separately).



Find $\sin(13\pi/6)$



Find $\cos(-9\pi/4)$

Question 3

If $\sin(\theta) = \frac{-45}{53}$, and θ is in quadrant IV, determine an exact value for $\cos(\theta)$.

Question 4

A mass-spring system oscillates vertically with an amplitude of 2.09 meters, a frequency of 7.93 Hz, and a midline at $y = 5.29$ meters. At $t = 0$, the mass is at the midline and moving up. Write an equation to model the height (y in meters) as a function of time (t in seconds).